This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A fiber optic gyroscope comprising:

a loop including a single mode optical fiber having a first end and a second end; and

a depolarizer region coupled to said loop, said depolarizer region comprising: ~~including~~

a first optical fiber section; ~~coupled to~~

a second optical fiber section coupled to said first optical fiber section via a first splice; ~~and~~

a third optical fiber section; ~~coupled to~~

a fourth optical fiber section coupled to said first optical fiber section via a third splice; ~~,~~

wherein

said first optical fiber section is coupled to said first end of said loop via a second splice; ~~and~~

said third fiber section is coupled to said second end of said loop via a fourth splice; ~~, and wherein~~

said first optical fiber section has a length *y*, said second optical fiber section has a length *w*, said third optical fiber section has a length *z*, and said fourth optical fiber section has a length *x*; and wherein $x + z$ is substantially equal to $w + y$;

wherein $w > x$ and $z > y$;

said first, second, third and fourth fiber sections comprise polarization maintaining fibers;

said first splice having an alignment between 35^0 and 55^0 between a major axis of polarization of said first optical fiber section and a major axis of polarization of said second optical fiber section; and

said third splice having an alignment between 35^0 and 55^0 between a major axis of polarization of said third fiber section and a major axis of polarization of said fourth fiber section, whereby thermal and mechanical influences on the optical path lengths of each one of said optical fiber sections are substantially the same.

2. (cancelled).

3. (original) The fiber optic gyroscope of claim 2, wherein w is substantially equal to $n * x$, and n is an integer.

4. (original) The fiber optic gyroscope of claim 3, wherein $n = 2$.

5. (original) The fiber optic gyroscope of claim 2, wherein $x + z$ is a length measuring between 6.5 meters and 7.5 meters.

6. (original) The fiber optic gyroscope of claim 2, wherein each one of said first, second, third, and fourth optical fiber sections exhibit a beat length L_B, and wherein w is substantially equal to $2200L_B$, x is substantially equal to $1100L_B$, y is substantially equal to $800L_B$, and z is substantially equal to $1900L_B$.

7. (cancelled).

8. (currently amended) A method for minimizing time-derivative errors in a fiber optic gyroscope, the method comprising:

providing a depolarizer having two segments of polarization maintaining optical fiber, a first segment, and a second segment, coupled to an optical fiber loop, wherein the two segments are of substantially equal length;

providing each polarization maintaining optical fiber segment with two optical fiber sections connected together via a splice, each splice having an angle from about 35° to 55° between major axes of polarization of the corresponding pair of optical fiber sections, said first optical fiber section has a length *y*, said second optical fiber section has a length *w*, said third optical fiber section has a length *z*, and said fourth optical fiber section has a length *x*; and wherein $x + z$ is substantially equal to $w + y$, wherein $w > x$ and $z > y$; and

choosing the length of each optical fiber section to maintain at least one of thermal and ~~/or~~ mechanical symmetry of the optical fiber loop.

9. (original) The method of claim 8, wherein the depolarizer is coupled to an integrated

optical chip and the optical fiber loop.

10. (original) The method of claim 8, wherein the optical fiber loop is a single mode optical fiber loop.

11. (currently amended) An inertial guidance system including a fiber optic gyroscope, the gyroscope comprising:

a light source having a short coherence length;

an integrated optic chip coupled to the light source;

a fiber loop having a fixed length, and having a first end and a second end; and

a depolarizer including two polarization maintaining fiber segments, a first segment and a second segment, each of said fiber segments including one or more splices and coupling a respective end of said fiber loop to the integrated optic chip, wherein ~~whereby~~ at least one of mechanical and ~~/or~~ thermal symmetry is maintained and polarization errors are suppressed, a splice in said first segment joining two sections of said first segment being located further away from said first end of said fiber loop than a splice in said second segment joining two sections of said second segment is located away from said second end of said fiber loop.

12. (original) The inertial guidance system of claim 11, wherein said fiber loop comprises a coil of symmetrically wound single mode fiber measuring approximately 1000 meters in length.

13. (original) The inertial guidance system of claim 11, wherein said integrated optic chip comprises a polarizer having blocking axis and a transmission axis, and a splitter which splits and modulates incoming light.

14. (cancelled).

15. (original) The inertial guidance system of claim 14, wherein the slice coupling said first section and said second section has an angle from about 35° to 55° between major axes of polarization of said first and second sections.

16. (cancelled).

17. (currently amended) The inertial guidance system of claim 16, wherein said splice coupling said third section to said fourth section has an angle from about 35° to 55° between major axes of polarization of said third and fourth sections.

18. (original) The inertial guidance system of claim 16, wherein said first section has a length *y*, said second optical fiber section has a length *w*, said third optical fiber section has a length *z*, and said fourth optical fiber section has a length *x*, wherein $x + z$ is substantially equal to $w + y$.

19. (original) The inertial guidance system of claim 18, wherein *w* is substantially equal to $n * x$, and *n* is an integer.

20. (original) The inertial guidance system of claim 19, wherein $n = 2$.

21. (original) The inertial guidance system of claim 20, wherein $x + z$ is a length measuring between 6.5 meters and 7.5 meters.

22. (original) The inertial guidance system of claim 18, wherein each one of said first, second, third, and fourth optical fiber sections exhibit a beat length L_B, and wherein *w* is substantially equal to $2200L_B$, *x* is substantially equal to $1100L_B$, *y* is substantially equal to $800L_B$, and *z* is substantially equal to $1900L_B$.

23. (original) The inertial guidance system of claim 11, wherein said integrated optic chip comprises a polarizer and a splitter configured to split and modulate incoming light into ports, and recombine counter-rotating beams of light from said loop via said depolarizer.